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Covidien
IP Counsel
Respiratory & Monitoring Solutions
60 Middleton Avenue
North Haven, CT 06473

EXAMINER	
PHAM, TAMMY T	
ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/508,916	MCCREARY ET AL.	
	Examiner	Art Unit	
	Tammy Pham	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 September 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Casebolt (US Patent No: 5,355,149) in view of Sherbeck (US Patent No: 4,703,316).

2. **As for independent claims 1, 10,** Casebolt teaches of a touchframe system (Fig. 1, item 10) for determining the position of a touch event within a display area (Fig. 1, item 12), the system (Fig. 1, item 10) comprising: a plurality of light emitting elements (Fig. 1, item 16) positioned around the perimeter of the display area (Fig. 1, item 12); a plurality of light receiving elements (Fig. 1, item 18), each of the light receiving elements (Fig. 1, item 18) in combination with a plurality of the light emitting elements (Fig. 1, item 16) forming a zone of light beam paths, the number and positioning of receivers (Fig. 1, item 18) being sufficient to form partially overlapping zone pairs such that the touch event lies within at least two partially overlapping zone pairs; and a processor (Fig. 2, item 32) programmed to: monitor each of the zone pairs for blockage of at least one light beam path; and upon such blockage, calculate the location of the touch event associated with the blockage based on the end points of at least two intersecting blocked light beam paths from a first zone pair and two intersecting blocked light beam paths from a second zone pair (column 4, lines 13-20).

3. Casebolt fails to teach that the calculation of the location of the touch event associated with the blockage is based on the slopes of at least two intersecting blocked light beam paths.

4. Sherbeck teaches that the calculation of the location of the touch event associated with the blockage is based on the slopes of at least two intersecting blocked light beam paths (column 4, lines 45-70).

5. It would have been obvious to one with ordinary skill in the art at the time the invention was made to use the slopes of at least two intersecting blocked light beam paths as taught by Sherbeck with the location of the blockage calculations as taught by Casebolt in order to reduced the number of lights sources (Sherbeck, column 1, lines 60-65).

6. **As for independent claim 14,** Casebolt teaches of a touchframe system (Fig. 1, item 10) comprising: a plurality of opposed perimeter sections; a plurality of triangular zones, each including a row of light emitting elements (Fig. 1, item 16) positioned along one of the perimeter sections and an associated light receiving element (Fig. 1, item 18) positioned along the perimeter section opposite the light emitting elements (Fig. item 16), each of the light emitting elements (Fig. 1, item 16) and associated light receiving element (Fig. 1, item 18) defining a light beam path; and a processor (Fig. 2, item 32) programmed to: randomly activate the light emitting elements (Fig. 1, item 16), one at a time; monitor the output of each light receiving element (Fig. 1, item 18) associated with the activated light emitting element (Fig. 1, item 16) for blockage of a light beam path; and upon such blockage, calculate the location of the source of blockage based on the end points of at least two intersecting blocked light-beam paths.

7. Casebolt fails to teach of a memory device that stores the slopes and end points of each light beam; and that the calculation of the location of the source of blockage is based on the slopes of at least two intersecting blocked light-beam paths.

8. Sherbeck teaches of a memory device that stores the slopes and end points of each light beam (column 4, lines 1-35); and that the calculation of the location of the source of blockage is based on the slopes of at least two intersecting blocked light-beam paths (column 4, lines 45-70).

9. It would have been obvious to one with ordinary skill in the art at the time the invention was made to use the slopes of at least two intersecting blocked light beam paths as taught by Sherbeck with the location of the blockage calculations as taught by Casebolt in order to reduced the number of lights sources (Sherbeck, column 1, lines 60-65).

10. **As for independent claim 25,** Casebolt teaches of a method of determining the location of a touch event within a display area (Fig. 1, item 12) surrounded by a touch frame having a plurality of light emitting elements (Fig. 1, item 16) and a plurality of light receiving elements (Fig. 1, item 18) forming a plurality of triangular zones of light beam paths each having a slope and endpoints, the number and positioning of receivers (Fig. 1, item 18) being sufficient to form partially overlapping zone pairs, the method comprising: for each of the plurality of triangular zones, randomly activating the light emitting elements (Fig. 1, item 16, column 2, lines 55-60), one at a time; monitoring the output of each light receiving element (Fig. 1, item 18) associated with the activated light emitting element (Fig. 1, item 16) for blockage of a light beam path; and upon such blockage, calculating the location of the source of blockage based on the end points of at least two intersecting light beams paths (column 2, lines 55-60).

11. Casebolt fails to teach of storing the slopes and end points of each light beam path; and calculating the location of the source of blockage based on the slopes and end points of at least two intersecting blocked light-beam paths.

12. Sherbeck teaches of storing the slopes and end points of each light beam path; and calculating the location of the source of blockage based on the slopes and end points of at least two intersecting blocked light-beam paths (column 4, lines 1-70).

13. It would have been obvious to one with ordinary skill in the art at the time the invention was made to use the slopes of at least two intersecting blocked light beam paths as taught by Sherbeck with the location of the blockage calculations as taught by Casebolt in order to reduced the number of lights sources (Sherbeck, column 1, lines 60-65).

14. **As for independent claim 30,** Casebolt teaches of a touchframe system (Fig. 1, item 10) for determining the position of a touch event within a display area (Fig. 1, item 12), the system (Fig. 1, item 10) comprising: a plurality of light emitting elements (Fig. 1, item 16) positioned around the perimeter of the display area (Fig. 1, item 12); a plurality of light receiving elements (Fig. 1, item 18), each of the light receiving elements (Fig. 1, item 18) in combination with a plurality of the light emitting elements (Fig. 1, item 16) forming a zone o flight beam paths, the number and positioning of receivers (Fig. 1, item 18) being sufficient to form partially overlapping zone pairs such that the touch event lies within at least one partially overlapping zone pair; and a processor (Fig. 2, item 32) programmed to: randomly activate the light emitting elements (Fig. 1, item 16, column 2, lines 55-60), one at a time; monitor the output of each light

item 16) for blockage of a light beam path and upon such blockage, calculating the location of the source of blockage based on the end points of at least two intersecting light beams paths (column 2, lines 55-60).

16. Casebolt fails to teach that upon such blockage, calculate the location of the touch event associated with the blockage based on the slopes and end points of at least two intersecting blocked light-beam paths.

17. Sherbeck teaches that upon such blockage, calculate the location of the touch event associated with the blockage based on the slopes and end points of at least two intersecting blocked light-beam paths (column 4, lines 45-70).

18. It would have been obvious to one with ordinary skill in the art at the time the invention was made to use the slopes of at least two intersecting blocked light beam paths as taught by Sherbeck with the location of the blockage calculations as taught by Casebolt in order to reduced the number of lights sources (Sherbeck, column 1, lines 60-65).

19. **As for claims 2, 11,** Casebolt teaches that the processor (Fig. 2, item 32) monitors each of the zone pairs for blockage by being programmed to: randomly activate the light emitting elements (Fig. 1, item 16), one at a time; and monitor the output of each light receiving element (Fig. 1, item 18) associated with the activated light emitting element (Fig. 1, item 16) for an output indicative of a blocked light beam path (column 2, lines 55-60).

20. **As for claims 3, 12, 18,** Casebolt teaches that the processor (Fig. 2, item 32) is further programmed to activate the light emitting elements (Fig. 1, item 16) at pseudo random intervals (column 2, lines 58-64).

20. **As for claims 4, 13, 19,** Casebolt teaches that the processor (Fig. 2, item 32) is further programmed to activate the light emitting elements (Fig. 1, item 16) in a pseudo random sequence (column 2, lines 58-64).

21. **As for claim 5,** Casebolt teaches that the light receiving element (Fig. 1, item 18) outputs a signal having a pulse edge upon receipt of light and the processor is programmed to tag a light beam as blocked in the absence of a pulse edge in the light receiving element (Fig. 1, item 18, column 6, lines 67-2) output.

22. **As for claim 6,** Casebolt as modified by Sherbeck teaches that the processor (Casebolt, Fig. 2, item 32)is programmed to select the first and second zone pairs based on the angles ("slopes") formed by the intersecting light beam paths (column 4, lines 45-70).

23. **As for claim 7,** Casebolt teaches that the processor is further programmed to select those zones pairs having the most orthogonal angles (Fig. 1).

24. **As for claim 8,** Casebolt fails to teach that the processor is programmed such that, when the touch event blocks an odd plurality of light beam paths within a zone, touch event location calculation is done using the center blocked light beam path.

25. Sherbeck teaches that the processor is programmed such that, when the touch event blocks an odd plurality of light beam paths within a zone, touch event location calculation is done using the center blocked light beam path (column 4, lines 45-70).

26. It would have been obvious to one with ordinary skill in the art at the time the invention was made to find the center blocked light beam path in calculating the location as taught by Sherbeck with the touchframe system of Casebolt in order to shorten the scan cycle time (Sherbeck, column 1, lines 60-65).

27. **As for claim 9,** Casebolt fails to teach that the processor is programmed such that, when the touch event blocks an even plurality of light beam paths within a zone, touch event location calculation is done using a virtual beam located between the two central blocked light beam paths.

28. Sherbeck teaches that the processor is programmed such that, when the touch event blocks an even plurality of light beam paths within a zone, touch event location calculation is done using a virtual beam located between the two central blocked light beam paths (column 4, lines 45-70).

29. It would have been obvious to one with ordinary skill in the art at the time the invention was made to find the center blocked light beam path in calculating the location as taught by Sherbeck with the touchframe system of Casebolt in order to shorten the scan cycle time (Sherbeck, column 1, lines 60-65).

30. **As for claim 15,** Casebolt teaches that each row of light emitting elements (Fig. 1, item 16) has two associated light receiving elements (Fig. 1, item 18) positioned such that the two triangular zones formed by the light emitting elements (Fig. 1, item 16) partially overlap.

31. **As for claim 16,** Casebolt fails to teach that the light receiving elements have an associated acceptance angle and the light emitting elements have an associated angle of light dispersion and the elements are arranged relative each other such that the center of the acceptance angle of each receivers is directed toward the center of the row of light emitting elements and the center of the angle of dispersion of each light emitting element is directed toward a point midway between the two receivers.

32. Sherbeck teaches that the light receiving elements have an associated acceptance angle and the light emitting elements have an associated angle of light dispersion and the elements are arranged relative each other such that the center of the acceptance angle of each receivers is directed toward the center of the row of light emitting elements and the center of the angle of dispersion of each light emitting element is directed toward a point midway between the two receivers (column 4, lines 35-70).

33. It would have been obvious to one with ordinary skill in the art at the time the invention was made to combine have the calculation of the blocked location of Casebolt be based from the angle/slope of acceptance and center points of the receivers as taught by Sherbeck in order to shorten the scan time by decreasing the amount of data that needs to be calculated (Sherbeck, column 1, lines 60-65).

34. **As for claim 17,** Casebolt teaches that the location of the light receiving element (Fig. 1, item 18) defines the end points of the light beam paths.

35. **As for claim 20,** Casebolt teaches that the processor (Fig. 2, item 32) is programmed to inspect at least one orthogonal pair of triangular zones associated with the source of blockage for the two intersecting light beam paths (Fig. 1).

36. **As for claims 21, 26,** Casebolt teaches that the processor (Fig. 2, item 32) monitors the output of each light receiving element (Fig. 1, item 18) associated with the activated light emitting element (Fig. 1, item 16) for blockage of a light beam path by being programmed to: compare the profile of the output to an expected profile having a time-based noise threshold; identify a light beam as noise if there is a pulse edge in the profile prior to the noise threshold; identify a light beam as connected if there is a pulse edge in the profile after the noise threshold; and identify all other light beams as blocked (column 10, lines 1-50).

37. **As for claims 22, 27,** Casebolt teaches that the time-based noise threshold is defined by the response time of the light receiving element (Fig. 1, item 16, column 10, lines 5-50).

38. **As for claims 23, 28,** Casebolt teaches that the processor (Fig. 2, item 32) comprises a state counter for counting the identification of a light beam over successive triggers of the light emitting element (Fig. 1, item 16) associated with the light beam and outputting a confirmed

blocked or connect identification after the counter has reached a specified value (Fig. 6, column 10, lines 1-50).

39. **As for claims 24, 29,** Casebolt teaches that the specified value is at least two successive triggers of the associated light emitting element (Fig. 6).

40. **As for claim 31,** Casebolt as modified by Sherbeck above, teaches of a memory device having stored therein the slopes and end points of each light beam path within each of the zones (column 4, lines 45-70).

41. **As for claim 32,** Casebolt as modified by Sherbeck above, teaches that the number and positioning of receivers (Casebolt, Fig. 1, item 18) is sufficient to form redundant overlapping zone pairs such that the touch event lies within at least two partially overlapping zone pairs; and the processor (Casebolt, Fig. 2, item 32) is programmed to calculate the location of the touch event based on the slopes and end point of a pair of intersecting blocked light-beam paths from each of the at least two partially overlapping zone pairs.

42. **As for claim 33,** Casebolt teaches that the processor is programmed to calculate the location of the touch event using the most orthogonally overlapping zone pairs (Fig. 1).

43. **As for claim 34,** Casebolt fails to teach that the processor is programmed to individually calculate a location of the touch event for each pair of intersecting blocked light-beam paths; and average the individual results to obtain the location of the touch event.

44. Sherbeck teaches that the processor is programmed to individually calculate a location of the touch event for each pair of intersecting blocked light-beam paths; and average the individual results to obtain the location of the touch event (column 4, lines 40-45).

45. It would have been obvious to one with ordinary skill in the art at the time the invention was made to average the location points or take the middle/center points as taught by Sherbeck in order to calculate the blocked light-beam paths as taught by Casebolt in order to shorten the scan time by decreasing the amount of calculations needed (Sherbeck, column 1, lines 64-66).

46. **As for claim 35,** Casebolt fails to teach that the zones are triangular with a row of light emitting elements forming one side of the triangle and one light receiving element forming an apex opposite the row of light emitting elements.

47. Sherbeck teaches that the zones are triangular with a row of light emitting elements (Fig. 1, items D0-D3) forming one side of the triangle and one light receiving element (Fig. 1, item Tr, Tl) forming an apex opposite the row of light emitting elements (Fig. 1, items D0-D3).

48. It would have been obvious to one with ordinary skill in the art at the time the invention was made to have the zones be triangular as taught by Sherbeck with the touchframe system of Casebolt in order to decrease the amount of light sources (Casebolt, column 1, lines 60-63).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tammy Pham whose telephone number is (571) 272-7773. The examiner can normally be reached on 8:00-5:30 (Mon-Fri).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on (571) 272-3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TP
17 January 2008

/T.P./
Tammy Pham
Patent Examiner
Art Unit 2629

/Sumati Lefkowitz/
SUMATI LEFKOWITZ
SUPERVISORY PATENT EXAMINER